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COSTS AND EFFICIENCY IN TURKEY PROCESSING PLANTS

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Economic Research Service
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PREFACE

The processing of turkeys is becoming concentrated increasingly in fewer and larger plants. Processing has become more efficient with the adoption of new technology and machinery and with increasing plant sizes. Nevertheless, cost and margin studies show a wide variation in turkey processing costs and an opportunity for many firms to increase their efficiency.

Recently completed research on costs and economies of scale in processing chickens provided scientifically developed guidelines to aid plant managers to increase efficiency. The Poultry Research and Marketing Advisory Committee and many individual firms asked the U. S. Department of Agriculture to undertake similar research to aid turkey processors. This report presents some of the preliminary results obtained from a survey of more than 25 turkey processing plants of various sizes and types. A later report will examine with more standardized procedures the potential economies of scale in turkey processing.

This study is part of a broad research program conducted by the Economic Research Service to improve the marketing of poultry and eggs.

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COSTS AND EFFICIENCY IN TURKEY PROCESSING PLANTS

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SUMMARY

Costs of processing turkeys in frozen ready-to-cook form, predominantly during 1960, were studied in representative plants in Minnesota, Wisconsin, Kansas, California, Utah, Colorado, and Virginia. Preliminary results show that costs --about 6.6 cents per pound in small plants--may decline to 5.4 cents per pound as plant size increases, but may rise again in the largest plants. The major items where costs per unit declined were for utilities, ice, freezing, storage, and overhead.

The marketing of turkeys from farms is heaviest from July to January. Processing plants need to be large enough to process the crop when it is marketed, but much of their capacity is unused the rest of the year. On an annual basis, almost half the plants studied operated at less than 30 percent of potential capacity and almost 85 percent of them at less than 50 percent of capacity. These plants could reduce their costs by operating at capacity the year round.

Lowest costs per pound were found among plants processing good-quality heavy young hens and toms. Higher costs resulted when breeders and fryer-roaster turkeys were processed.

The study reveals several areas where costs can be decreased. Plant managers should consider, besides the size of the plant, the following possibilities as well: Utilization of plant capacity, emphasis on processing particular market classes, substitution of equipment and facilities for labor, good organization of the working force, and proper selection and assignment of supervisory and office personnel.

INTRODUCTION

Material gains in the efficiency of turkey processing have occurred in recent years. These have been due to the adoption of new technology and machinery, increases in plant size, better utilization of capacity, and changes in industry structure. Processing costs per pound have not risen despite increases in wages and in prices of other items and services. Nevertheless, there remain wide variations in costs of turkey processing and in the degree of efficiency achieved by individual plants.

About 100 of the 600 commercial poultry slaughtering plants in the United States slaughter turkeys. Four-fifths of the 100 plants primarily slaughter turkeys; the other one-fifth slaughter more chickens than turkeys. Many turkey farmers dress and draw their own turkeys, selling most of their output locally and in fresh-killed form. On the other hand, most of the turkeys sold by commercial plants are frozen ready-to-cook. Many commercial turkey processing plants are owned and operated by farmer cooperatives. In 1960, commercial poultry slaughtering plants handled 80 percent of the live weight of turkeys sold from farms.

During late 1960 and early 1961, researchers visited more than 25 commercial turkey processing plants. The plants, ranging in capacity from less than 200 heavy young hens per hour to more than 2,000 per hour, were in Minnesota, Wisconsin, Kansas, California, Utah, Colorado, and Virginia. About 40 percent of the plants selected were farmer cooperatives. The sample included plants specializing in processing turkeys as well as plants which handled large volumes of chickens. Data obtained from these plants included plant layouts, types of equipment, crew organization, practices, volumes, and operating costs for the most recent accounting year.

The recordkeeping systems used by turkey processors vary widely. These systems frequently do not provide management with all the timely and detailed information needed to make decisions. Moreover, different methods of classifying and entering individual cost items make it difficult to compare the records of various plants.

The sample of plants studied represents about one-fourth of the commercial turkey processing plants in the United States, and a higher proportion of the volume. Thus, the conclusions should have general application. Many plants can make immediate gains in efficiency by studying and adopting some of the practices of more efficient organizations.

EFFECT OF PLANT SIZE ON COSTS

Preliminary analyses showed that total costs per pound for processing declined as plant size increased from less than 400 heavy young hens per hour to almost 1,500 per hour (table 1). Decreased unit costs for utilities, ice, freezing, storage, and overhead accounted for some of the declines in total costs. However, the variations in costs per pound for wage and salaries, packaging, supplies, and miscellaneous items are not necessarily related to plant size. The total costs per pound in table 1 should not be taken as a final judgment of the relationship between costs and plant size.

Processing costs presented in this report are for within-plant operations and do not include costs for procurement and delivery.

Costs varied widely among plants in each size group. Many factors in addition to plant size affect costs. Among the factors are age and condition of the plant, utilization of capacity, market classes handled, types of packs, labor and managerial efficiency, wage rates, and prices of other items and services.

Faced with the prospect of high costs per pound for processing, most small firms have developed premium local outlets for their turkeys. These outlets, plus selection and retention of nearby producers to minimize pickup and trucking costs, have enabled many small firms to offset the effects of high processing costs.

Table 1.--Average processing costs per pound (eviscerated weight), for heavy young turkeys in plants of various capacities, United States, 1960 1/

Item	Plant capacity (number of heavy young hens per hour of operation)					
	Less than 400	400-699	700-899	900-1,499	1,500-1,999	2,000 and over
	Cents	Cents	Cents	Cents	Cents	Cents
Wages and salaries 2/	2.33	2.30	2.28	2.11	2.31	2.25
Packaging, supplies, miscellaneous 3/	2.11	1.66	1.91	1.77	1.88	2.12
Utilities, ice, freezing, storage 4/	1.15	1.01	.78	.70	.74	.42
Fixed overhead 5/	.98	.90	.90	.81	.65	.83
Total processing costs 6/	6.57	5.87	5.87	5.39	5.57	5.62

1/ For most plants, records were for a fiscal year ending in 1960; however, for a few of the last plants visited, records were for a fiscal year ending in 1961.

2/ Includes plant labor for receiving, killing, picking, pinning, eviscerating, packing and boxing, cleanup, maintenance, freezing, storing, loading; and supervisory, office, and managerial personnel; plus fringe benefits.

3/ Includes all plant and office supplies, grading and inspection, professional services, management travel, dues, contributions, advertising.

4/ Includes ice if purchased; outside freezing and storage facilities where used; and allowance for storage on a share of volume if not otherwise included in plant records.

5/ Includes repairs and maintenance, rent, depreciation, interest, taxes, insurance.

6/ These processing costs are for door-to-door operations and do not include costs for procurement and delivery.

UTILIZATION OF PLANT CAPACITY

For many years, the processing of turkeys was a highly seasonal operation. For some plants it still is. Such firms process only heavy young hens and toms during July to January and perhaps a few breeders during the spring and early summer. However, in recent years the operating season has been lengthened by the growing of more than one batch of heavy young turkeys on some farms. This allows plants to make fuller use of capacity than formerly and to retain a regular and efficient labor force. Other plants attempt to achieve these objectives by using other market classes or by cutting up and boning turkeys and manufacturing further-processed products during the slack season.

Nevertheless, excess capacity still exists in turkey processing. Almost half of the plants studied operated at less than 30 percent of potential annual capacity, and almost 85 percent at less than 50 percent of potential annual capacity, as the following tabulation shows:

Percent of annual capacity utilized 1/	Percent of firms
0 - 9.9	8
10.0 - 19.9	15
20.0 - 29.9	23
30.0 - 39.9	23
40.0 - 49.9	15
50.0 - 59.9	12
More than 60.0	4

Costs per pound can be reduced if more efficient use can be made of the potential annual capacity. Reductions could be made particularly in fixed overhead costs such as repairs, maintenance, depreciation, rent, interest, taxes, and insurance, and fixed operating costs such as management salaries.

The ability to obtain additional volume depends not only on the persuasiveness of the plant buyer, but also on the size and density of local production. It may also depend increasingly on the willingness and ability of management to use or develop contract sources where these prove economical.

A number of the medium-sized and large plants in the sample processed breeder and fryer-roaster turkeys (sometimes called Beltsville-type) and chickens in addition to heavy young hens and toms. Some of these plants had higher costs than plants which processed only heavy young turkeys. The higher costs apparently resulted

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1/ Computed by assuming 247 operating days of 8 hours each per year. Capacity obtained by multiplying number of head of each market class of poultry (including chickens and turkeys) which can be processed per hour by the firm's average eviscerated weight for that class. The proportions of various market classes of poultry at capacity and at actual levels of operation were assumed to be the same.

from a combination of factors. These included time lost in changing over from one class of poultry to another; handling and storing additional types of packaging materials; use of a standard crew which cannot be readily adapted to least-cost operation for different classes; and additional supervisory, office, and managerial requirements. Thus, careful planning and flexibility are required to realize the gains which can result from better utilization of capacity.

COSTS OF PROCESSING VARIOUS MARKET CLASSES

The lowest costs per pound result when plants are processing good quality heavy young hens and toms. Total costs per pound are successively higher for breeders and fryer-roaster turkeys (table 2).

Fewer breeders than heavy young turkeys can be processed per hour. Breeders may often require additional pinning labor. Also, the cost per pound for bagging and packing is slightly higher for breeders than for heavy young hens and toms.

More fryer-roaster turkeys than heavy young turkeys can be processed per hour. However, since fryer-roaster turkeys are considerably smaller, lower total poundage per hour results. This produces a higher labor cost per pound of fryer-roasters, and higher packaging costs per pound despite some lower unit prices for bags and boxes.

Most of the processing lines in turkey processing plants were designed especially for turkeys. The equipment with its wide shackle-spacing may not permit least-cost operations when processing chickens. The cost per pound for processing chickens in turkey processing plants frequently is noticeably higher than in specialized chicken processing plants.

IMPROVING THE EFFICIENCY OF TURKEY PROCESSING

Costs depend partly on decisions of plant managers with respect to certain factors. Among these factors are utilization of plant capacity, emphasis on particular market classes, substitution of equipment and facilities for labor, organization of the working force, and selection and assignment of supervisory and office personnel.

Management may have little opportunity to control some cost items, such as supplies, materials, and utilities, and basic wage rates. Rates of use of supplies, materials, utilities, and miscellaneous items are related to trade practices, sanitary standards, and machine capacities.

Increases in plant size to obtain economies of scale and programs to increase supplies of desired market classes may require substantial long-term capital commitments. Hence, in the short run, little can be done about plant size or the available volume. Between seasons, processing lines can be changed and new equipment can be added. However, as the peak season approaches, the plant manager can consider only changes which relate to the number and use of employees.

As the study of turkey processing progresses, model plants of various capacities will be synthesized. An important aspect of such model plants is the determination of the minimum number of employees necessary for efficient operation. Preliminary tabulations have been made of the number of supervisory, office, and managerial personnel used by actual plants in relation to capacity (table 3), and the output achieved per man-hour of labor in processing (table 4).

Many industry people have long contended that "management overhead" has an important effect on turkey processing costs. Table 3 shows that the average number of heavy young turkeys processed per managerial employee increases with plant size. However, within each size group there is a wide range, suggesting that many processing plants have more supervisory, office, and management personnel than may be needed.

Most turkey processing plants handle their largest volumes of heavy young turkeys in the late summer and fall. The data for table 4 were taken from peak operating weeks in that period. They illustrate the output per man-hour which the more efficient plants in the sample were able to achieve. While there is an indication that output per man-hour tends to increase with plant size, some efficient small plants are outperforming larger ones in this respect.

The plant operator can easily measure his own performance with respect to "management overhead" and plant operations. He can use the data in tables 3 and 4 to run a preliminary check on how well his plant compares with others in these two important areas of costs.

Table 2.--Average processing costs per pound (eviscerated weight), for major market classes of turkeys, United States, 1960 1/

Item	Heavy young hens and toms	Breeders	Fryers-roasters
	Cents	Cents	Cents
Wages and salaries 2/ ...	2.27	2.68	3.04
Packaging, supplies, miscellaneous 3/	1.92	1.94	2.19
Utilities, ice, freezing storage 4/	.80	.73	.70
Fixed overhead 5/	.85	.85	.78
Total processing costs	5.84	6.20	6.71

1/ For most plants, records were for a fiscal year ending in 1960; however, for a few of the last plants visited, records were for a fiscal year ending in 1961.

2/ Includes plant labor for receiving, killing, picking, pinning, eviscerating, packing, boxing, cleanup, maintenance, freezing, storing, and loading; supervisory, office, and managerial personnel; plus fringe benefits.

3/ Includes all plant and office supplies, grading and inspection, professional services, management travel, dues, contributions, advertising.

4/ Includes ice if purchased; outside freezing and storage facilities where used; and allowance for storage on a share of volume if not otherwise included in plant records.

5/ Includes repairs and maintenance, rent, depreciation, interest, taxes, insurance.

Table 3.--Number of heavy young hens processed per hour per managerial employee in selected turkey processing plants, by size of plant, 1960 1/

Size of plant (turkeys processed per hour)	Average	Range
	Turkeys	Turkeys
Less than 400	119	63-175
400-699	148	136-160
700-899	160	110-212
900-1,499	184	130-260
1,500-1,999	224	192-260
2,000 and over	243	225-264

1/ Includes general supervision, office force, and overall management activities.

Table 4.--Output per man-hour in selected turkey processing plants, by volume processed per week, 1960 1/

Volume processed per week	Average	Range
Thousand Pounds	Pounds	Pounds
Less than 100	58	28- 78
100-199	72	46-100
200-299	72	48-113
300-499	86	63-124
500-699	101	59-148
700-899	104	67-160
900 and over	98	74-131

1/ Selected weeks in summer and fall when almost the entire volume consisted of heavy young hens and toms.